

### Amendments to the Claims

Claim 1 (currently amended): A method of producing at least one porous bead, which comprises the steps of

- (a) providing ~~Providing~~ a first liquid phase comprising a bead matrix material and at least one essentially edgy templating particle, said particle(s) being treated with a surface modifying agent;
- (b) providing ~~Providing~~ a second liquid phase which is immiscible with the first liquid phase;
- (c) contacting ~~Contacting~~ the first phase and the second phase under conditions resulting in an emulsion of droplets comprised of the first liquid phase dispersed in the continuous second liquid phase;
- (d) transforming ~~Transforming~~ the droplets to mesoporous beads by solidification of the liquid in said droplets; and
- (e) removing ~~Removing~~ the templating particle(s) from the beads without causing any essential change of the surrounding bead, whereby the mesoporous beads resulting from step (d) are supplemented with one or more larger pores corresponding to the cavities left by the removed templating particle(s);

whereby an essentially hierarchical network of pores is provided in each bead.

Claim 2 (currently amended): ~~A method according to~~ The method of claim 1, wherein a surface modifying agent is present in the first liquid phase when the templating particle(s) are added therein.

Claim 3 (currently amended): ~~A method according to~~ The method of claim 1, wherein the templating particle(s) are treated with a surface modifying agent before they are added to the first liquid phase.

Claim 4 (currently amended): ~~A method according to any one of the previous claims~~ The method of claim 1, which further comprises a step of diluting the droplet phase before step (c).

Claim 5 (currently amended): ~~A method according to any one of the previous claims~~ The method of claim 1, which further comprises a step of removing liquid from the droplet phase after step (c) but before step (d).

Claim 6 (currently amended): ~~A method according to any one of the previous claims~~ The method of claim 1, wherein the concentration of the templating particle(s) in the droplet phase is close to the percolation threshold during the solidification.

Claim 7 (currently amended): ~~A method according to any one of the previous claims~~ The method of claim 1, wherein the shape of the templating particle(s) is elongate and defined by an aspect ratio higher than two, ~~preferably higher than five~~.

Claim 8 (currently amended): ~~A method according to any one of the previous claims~~ The method of claim 1, wherein the shape of the templating particle(s) is edgy and defined by a sphericity lower than about 0.8, ~~preferably lower than about 0.6~~.

Claim 9 (currently amended): ~~A method according to any one of the previous claims~~The method of claim 1, wherein the shape of the templating particle(s) is edgy and defined by a circularity of the particle projection(s) lower than about 0.85; ~~preferably lower than about 0.6.~~

Claim 10 (currently amended): ~~A method according to any one of the previous claims~~The method of claim 1, wherein the templating particle(s) are acid-soluble and made from a material selected from the group ~~that consists~~ consisting of carbonate minerals, oxide minerals, calcium phosphate, magnesium hydroxide, and metals.

Claim 11 (currently amended): ~~A method according to~~ The method of claim 10, wherein the templating particles are removed by leaching with an acid.

Claim 12 (currently amended): ~~A method according to any one of claims 1-9~~The method of claim 1, wherein the templating particle(s) are siliceous particles and made from a material selected from the group ~~that consists~~ consisting of silica, diatomite, glass, and silicate minerals.

Claim 13 (currently amended): ~~A method according to~~ The method of claim 12, wherein the templating particles are removed by leaching with a fluorine compound.

Claim 14 (currently amended): ~~A method according to any one of claims 1-9~~The method of claim 1, wherein the templating particle(s) are organic or carbonaceous particles and made from a material selected from the group ~~that consists~~ consisting of organic polymers, low molecular weight organic crystals and carbon.

Claim 15 (currently amended): ~~A method according to any one of claims 1-9~~The method of claim 1, wherein the templating particle(s) are alkali-soluble particles and made from a material selected from the group ~~that consists~~ consisting of siliceous particles, metal particles and oxides, ~~such as alumina.~~

Claim 16 (currently amended): ~~A method according to~~ The method of claim 14 or 15, wherein the templating particles are removed by leaching with a base.

Claim 17 (currently amended): ~~A method according to any one of the previous claims~~The method of claim 1, wherein the templating particles are volatilised by heat treatment, optionally in the presence of air or oxygen.

Claim 18 (currently amended): ~~A method according to any one of the previous claims~~The method of claim 1, wherein the droplet phase of the emulsion is comprised of oil droplets.

Claim 19 (currently amended): ~~A method according to~~ The method of claim 18, wherein the bead matrix material is comprised of synthetic monomers and the transformation according to step (d) is a polymerisation in the presence of a porogen and a cross-linker.

Claim 20 (currently amended): ~~A method according to any one of claims 1-17~~The method of claim 1, wherein the droplet phase of the emulsion is comprised of aqueous droplets.

Claim 21 (currently amended): ~~A method according to~~ The method of claim 20, wherein the bead matrix material is comprised of a natural polymer and the transformation according to step (d) is a physical gelation.

Claim 22 (currently amended): ~~A method according to~~ The method of claim 20, wherein the aqueous droplets comprise an inorganic compound and the transformation according to step (d) is a sol-gel precipitation.

Claim 23 (currently amended): A separation matrix comprised of porous beads produced by the method of claim 1 ~~according to any one of claims 1-22~~, wherein each bead comprises a network of hierarchical pore sizes.

Claim 24 (currently amended): A separation matrix or catalyst support comprised of porous beads produced by the method of claim 1 ~~according to any one of claims 1-22~~, wherein the beads have an ellipsoidal shape with an aspect ratio  $> 1.2$ , ~~preferably~~  $> 1.5$ .